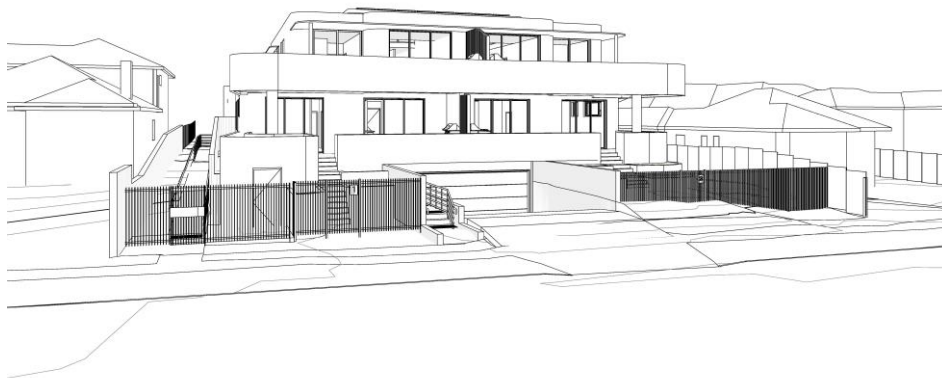


SOLAR ACCESS

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SENIOR HOUSING

52 & 54 BRIGHTON ST FRESHWATER

07<sup>th</sup> July 2023 – Revision A

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## 1.0 PRELIMINARIES AND SUMMARY

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### 1.1 PRELIMINARIES

- 1.1.1 This expert opinion report is an analysis and verification of projected **solar access** compliance for the DA proposal comprising of 8 apartments at 52-54 Brighton Street Freshwater.
- 1.1.2 Our qualifications and experience are summarized in *A.0 APPENDIX A: CREDENTIALS*.
- 1.1.3 The documents referred to in this report are detailed in *2.1 DOCUMENTS*.

### 1.2 SUMMARY OF DA SCHEME

#### 1.2.1 SOLAR ACCESS FOR APARTMENTS

To undertake the analysis we use a 3D model of the proposal located in the surrounding context. We then take hourly views from the sun (Appendix B), and a detailed compliance table of the DA scheme is prepared (Appendix C).

**6/8 (75%)** of the dwellings achieve 2 hours or more sunlight to the living area glazing and Private Open Space (POS) between 9am-3pm on June 21<sup>st</sup>. **This represents full compliance with design criterion 1 of the ADG Objective 4A-1.**

**0/8 (0%)** of the dwellings are projected to achieve no sun 9am – 3pm June 21. **This represents full compliance with design criterion 3 of the ADG Objective 4A-1**

### 1.3 SUMMARY OF OVERSHADOWING IMPACTS

We have reviewed the overshadowing impacts to neighbouring sites. All sites would still maintain their current solar access to living areas, and all sites would have more than three hours of solar access to private open spaces.

## 2.0 DOCUMENTS AND INFORMATION

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### 2.1 DOCUMENTENTS

2.1.1 We base our analysis and opinion on drawings by Walsh Architects:

DRAWING NO.	DRAWING NAME	ISSUE
DA040	PROPOSED SITE PLAN	A
DA100	BASEMENT PLAN	A
DA102	GROUND FLOOR PLAN	A
DA103	LEVEL 1 PLAN	A
DA104	ROOF PLAN	A
DA200	LONG SECTIONS	A
DA201	CROSS SECTIONS	A
DA300	ELEVATIONS – SHEET 1	A
DA301	ELEVATIONS – SHEET 2	A

3D digital model in Revit 2023.

Survey information from Bee and Lethbridge dated 14/04/2023.

## 2.2 SITE

The site is generally rectangle in shape with the short boundaries facing North and South. There are long side boundaries facing east and west. The site does not have much overshadowing from neighbouring buildings.

The site has a gentle slope with the highest point in the South East corner and the lowest in the North West corner.



Figure 1: Site Plan

### 3.0 SOLAR ACCESS

#### 3.1 RELEVANT SOLAR ACCESS STANDARDS

##### 3.1.1 SEPP HOUSING 2021

For Seniors Housing there are standards in place which also align with the requirements of the Apartment Design Guide outlined in 3.1.2. The SEPP Housing 2021 has two references to solar access. In Clause 108 (g) it states:

*“at least 70% of the dwellings receive at least 2 hours of direct solar access between 9am and 3pm at mid-winter in living rooms and private open spaces,”*

This item aligns with the ADG requirements also.

The SEPP also has in clause 101 design guidance

*The design of seniors housing should—*

*(a) for development involving the erection of a new building—provide residents of the building with adequate daylight in a way that does not adversely impact the amount of daylight in neighbouring buildings, and*

*(b) involve site planning, dwelling design and landscaping that reduces energy use and makes the best practicable use of natural ventilation, solar heating and lighting by locating the windows of living and dining areas in a northerly direction.*

##### 3.1.2 APARTMENT DESIGN GUIDE

The *Apartment Design Guide (ADG)* gives effect to SEPP65 for assessing solar access and other amenity provisions and gives the following quantified recommendations:

<i>Objective 4A-1</i>	
<b>To optimise the number of apartments receiving sunlight to habitable rooms, primary windows and private open space</b>	
<i>Design criteria</i>	
1.	Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid winter in the Sydney Metropolitan Area and in the Newcastle and Wollongong local government areas
2.	In all other areas, living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 3 hours direct sunlight between 9 am and 3 pm at mid winter
3.	A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid winter

##### 3.1.3 LOCAL CONTROLS

We note that **Solar access (6.1) Design criteria** in the ADG are *discretionary controls* which, by virtue of Cl. 6A of SEPP65, take precedence over controls contained in Councils' DCPs.

*In quantifying the compliance for solar access for this application, we rely on satisfying the ADG as also satisfying any DCP requirement.*

## 3.2 PREDICTED SOLAR ACCESS: METHODOLOGY

We employ the following analysis methodology.

### 3.2.1 3D DIGITAL MODEL

For a detailed analysis of overshadowing and solar access, we refer to a 3D model that has produced in Autodesk Revit 2023.

### 3.2.2 MODEL LOCATION

We have geo-located the model and verified the direction of North with reference to the survey.

### 3.2.3 ACCURACY OF THE MODEL

From the model, we have summarily checked topographical and building dimensions that might otherwise give rise to any errors, by reference to figured RL dimensions. With further reference to the survey, we have established the accuracy of the key points and thus we feel confident to rely on the general accuracy of the modelling.

### 3.2.4 VIEWS FROM THE SUN

The Autodesk Revit software prepares the shadow projections by reference to accurate solar geometry. Because of the complexity of demonstrating the quantification of solar access to glazing and private open space of various orientations, our detailed analysis was performed primarily by using projections known as **'View from the Sun'** taken at half hourly intervals.

A view from the sun shows all sunlit surfaces at a given time and date. It therefore allows a very precise count of sunlight hours on any glazing or horizontal surface, with little or no requirement for secondary calculations or interpolation. The technique is illustrated in Figure 1.

*Note that a 'view from the sun' by definition does not show any shadows.*

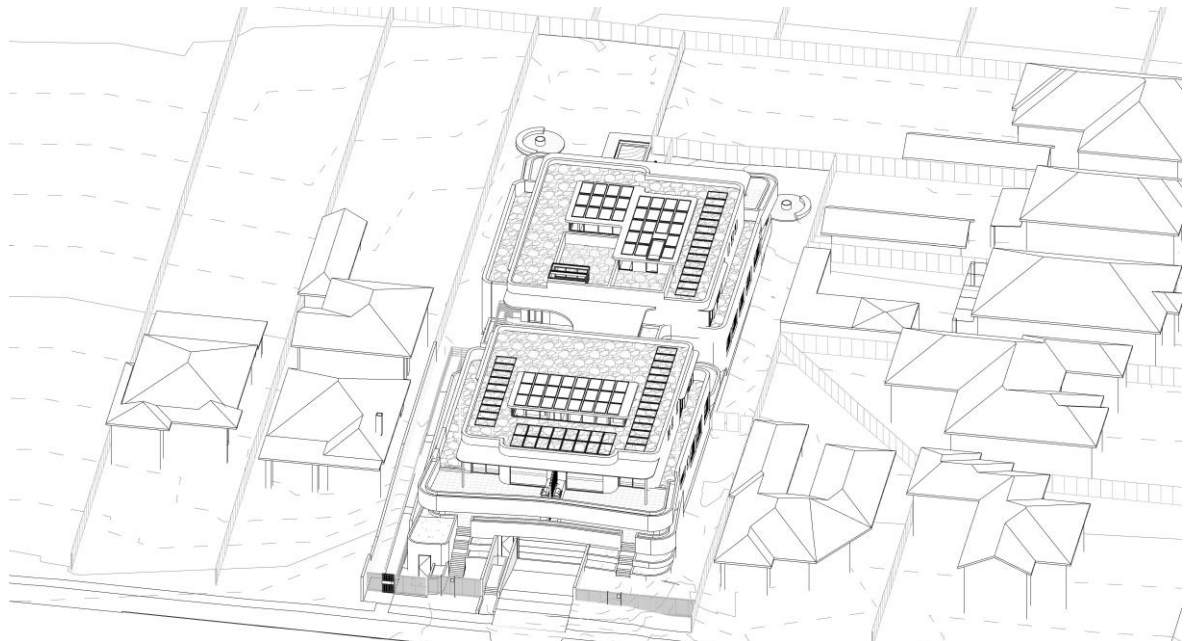


Figure 2: View from the sun, 12pm June 21

### 3.3 CHARACTERISATION OF SOLAR ACCESS COMPLIANCE

#### 3.3.1 SUN PATCHES ON GLAZING

For the purpose of calculating the compliance with the control, we examine sun patches on the relevant glazing line of each apartment. Because of its key importance in the determination of what is 'effective sunlight' for characterisation of compliance, for both glazing and private open space, we refer specifically to the relevant *L+EC Planning Principle (The Benevolent Society v Waverley Council [2010] NSWLEC 1082)* in that:

- We quantify as complying all sun patches of 'reasonable size', which we generally take to be a minimum of approximately 1m<sup>2</sup>.
- We ignore very large angles of incidence to the glazing surface, and unusably small areas of sunlit glazing.

There is no accepted standard for the absolute limit of acceptable area of the sun patch on partly shaded glazing. In accordance with the Court's Planning Principle, we consider this to be approximately 1m<sup>2</sup> (on the basis that it exceeds 50% of the area of a standard window 1500 x 1200 high which would normally be accepted as complying).

#### 3.3.2 SUN TO BEDROOMS

Periods of sun available to bedrooms contribute significantly to the amenity of any apartment that may have an otherwise unfavourably oriented or overshadowed living area. This characterisation is consistent with the interpretation of *the BenSoc Principle* (and its predecessor *Parsonage Principle*) as previously accepted by the Land and Environment Court, and by various Councils.

*That said, in evaluating this development, we **do not** rely on periods of sun to bedrooms in lieu of living areas to characterise apartments as complying with the ADG Design criterion.*

#### 3.3.4 SUN TO BOTH POS AND LIVING

Objective 4A-1 of the ADG states "Living rooms **and** private open spaces". The use of the conjunctive "and" has been tested in the Land and Environment Court in the case *Landmark Group Australia Pty Ltd v Council of the City of Sydney [2019] NSWLEC 1338* where in 227, Commissioner Smithson did not agree that a development could count living rooms **or** private open space. In line with the ADG wording and the LEC case noted above, we only count units that receive complying sun to both living rooms and private open space.



## 4.0 SOLAR ACCESS

### 4.1 PREDICTED SOLAR ACCESS OF APARTMENTS

Table 1 below summarises the projected solar access for the living area glazing and private open space of the Development Application. Appendix C records the detailed solar access for individual apartments.

Total number of Apartments	8	
Apartments which achieve 2 hours or more sunlight to living and POS 9am – 3pm June 21	6	<b>75%</b>
Units with no sun between 9am and 3pm June 21	0	<b>0%</b>

Table 1: Summary of solar access for DA scheme

The ADG Design criteria recommends a minimum of 70% of apartments should have the amenity of two hours winter sun between 9 AM and 3 PM. This Development Application has 75% (6/8) total of such apartments. **Overall compliance for solar access is therefore fully satisfied.**

The ADG design criteria recommends that a maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid-winter. This Development Application has 0% (0/8) total of such apartments **Overall compliance for solar access is therefore fully satisfied.**

The proposed development also has maximised indirect light to all of the apartments, with appropriate ceiling heights and floor-to-ceiling glazing along the width of the living space of each of the apartments. As such, the proposed apartments should feel light and airy.

## 5.0 OVERSHADOWING IMPACT ON NEIGHBOURING PROPERTIES

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The same views from the sun employed for the solar access analysis for the subject site are also the most effective technique for identifying potential overshadowing impacts for neighbouring properties.

### 5.1 OVERSHADOWING OF NEIGHBOURING PROPERTIES

We have reviewed the solar access of the neighbouring dwellings. As they are not multi-residential, we have not used Objective 3B-2 of the ADG, but instead we have looked at Warringah DCP 2011 D6 (2) which states:

*2. At least 50% of the required area of private open space of each dwelling and at least 50% of the required area of private open space of adjoining dwellings are to receive a minimum of 3 hours of sunlight between 9am and 3pm on June 21.*

Based off the above the above, we have reviewed if the neighbouring dwellings receive 3 hours of solar access to their Private Open Space. All neighbouring dwellings still receive this 3 hours of solar access to POS so all comply with the DCP requirement.

## 6.0 CONCLUSIONS

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### 6.1 SOLAR ACCESS FOR APARTMENTS

#### 6.1.1 ADG COMPLIANCE

The ADG *Design criteria* recommends a minimum of 70% of apartments should have the amenity of two hours winter sun between 9 AM and 3 PM.

**6/8 (75%)** of the apartments are projected to achieve 2 hours or more sunlight to glazing and POS 9am – 3pm June 21. **This does represents full compliance with design criterion 1 of the ADG Objective 4A-1.**

**0/8 (0%)** of the apartments are projected to achieve no sun 9am – 3pm June 21. **This represents full compliance with design criterion 3 of the ADG Objective 4A-1.**

### 6.2 OVERSHADOWING OF NEIGHBOURING SITES

All neighbouring dwellings still receive this 3 hours of solar access to POS so all comply with the DCP requirement.

**A.0 APPENDIX A: CREDENTIALS**

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Walsh Architects provides opinion based services primarily in relation to analysis and reporting of solar access and overshadowing compliance of multi residential projects.

**Scott Walsh** is a Director of Walsh Architects. He developed his specialised expertise under Steve King, a well-known expert in the field.

Scott started working for Steve King in 2011 as a tutor of Environmental Design at the University of New South Wales. From 2013 Scott has contracted to Steve King to undertake modelling and numerical analysis of solar access to large apartment projects. Over a number of years Scott contributed significantly to fine-tune the way the analysis was undertaken, and assisted in providing to the architects feedback in regards to areas that could be adjusted to improve solar access.

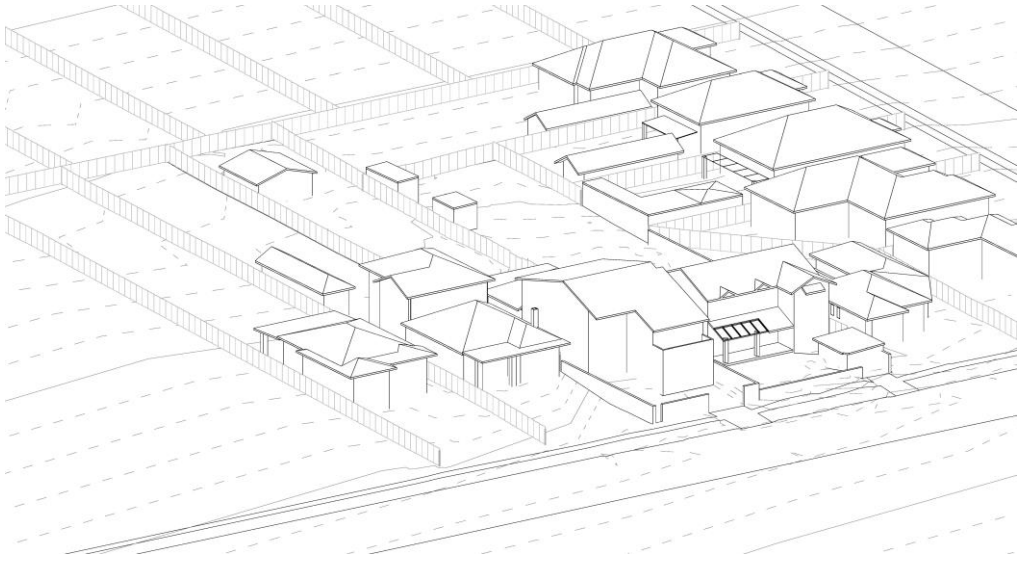
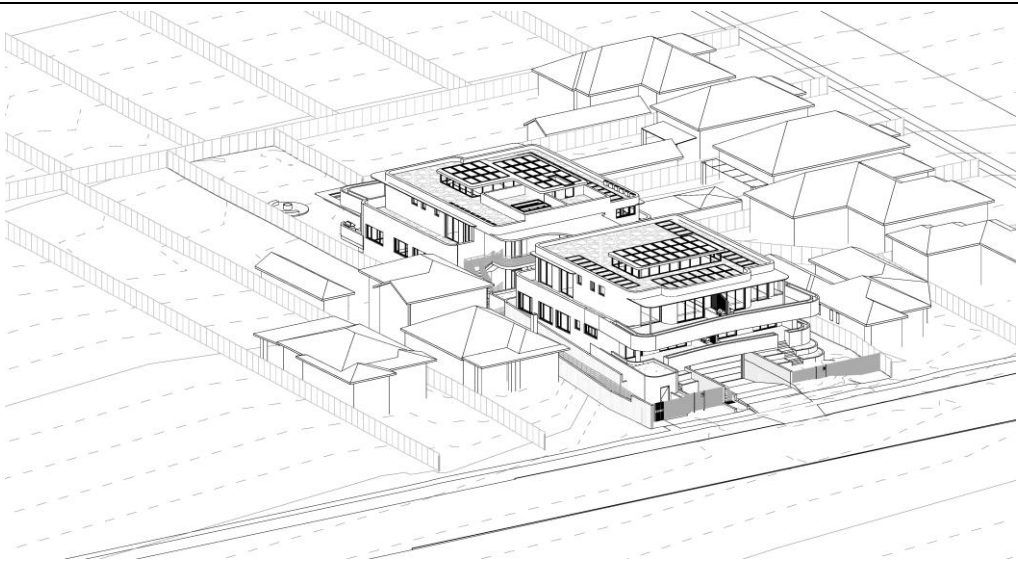
Scott holds a Masters of Architecture from the University of New South Wales as well as a Bachelor of Architecture. He is a registered architect in New South Wales (10366) and the Australian Capital Territory (2624) and a director of Walsh Architects.

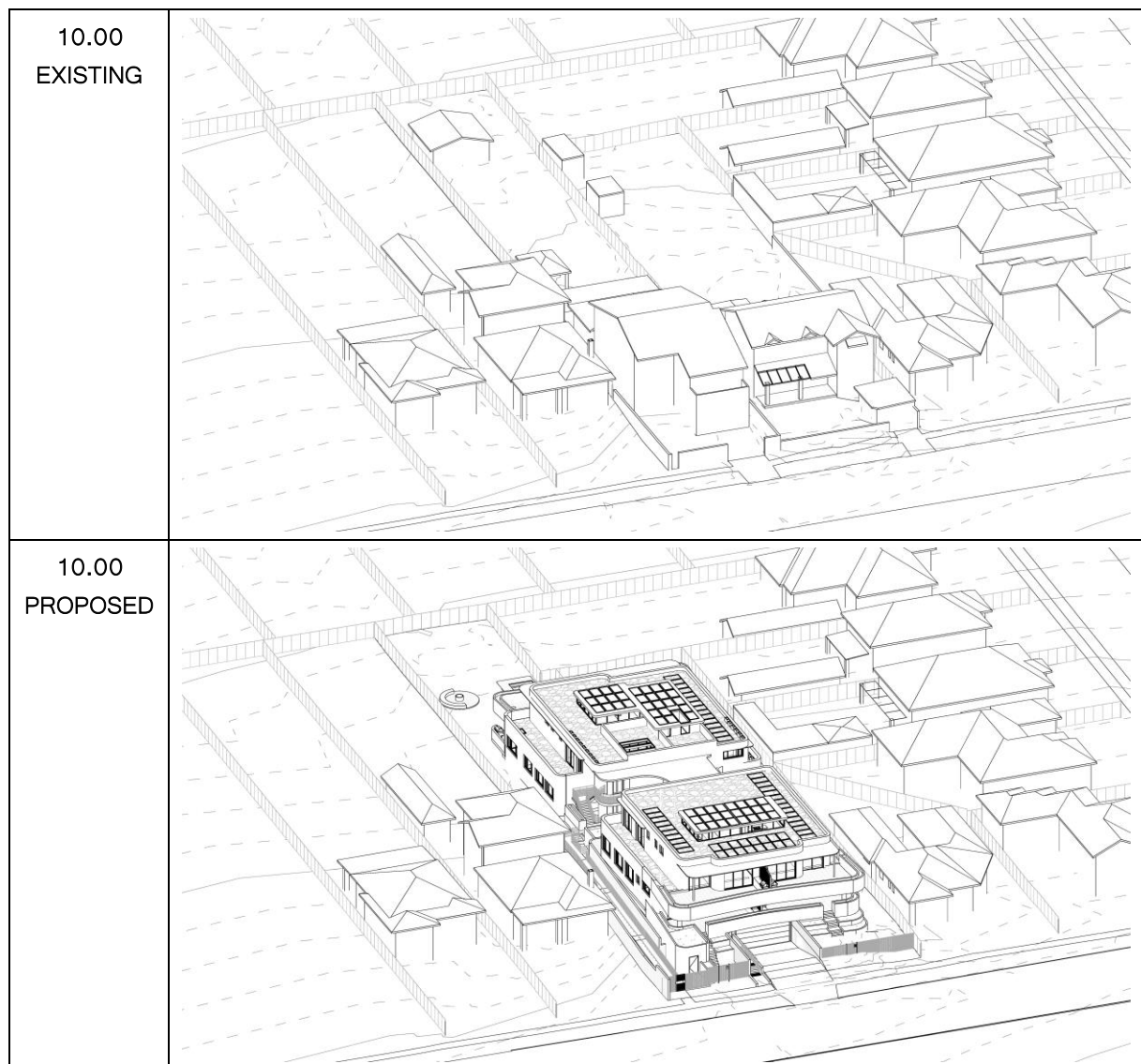
**Steve King:**

*I am pleased to provide my commendation and support for Walsh Architects. Scott has undertaken solar access and overshadowing analysis of over 150 apartment buildings from as small as 10 units up to over 1000 units. I have relied on his technical expertise and accuracy to provide advice to architects, planners and to the Land and Environment Court, including independent third-party peer review of others' characterisation and reporting of compliance.*

**B.0 APPENDIX B: VIEWS FROM THE SUN**

The table shows half-hourly views of solar access projections for June 21.

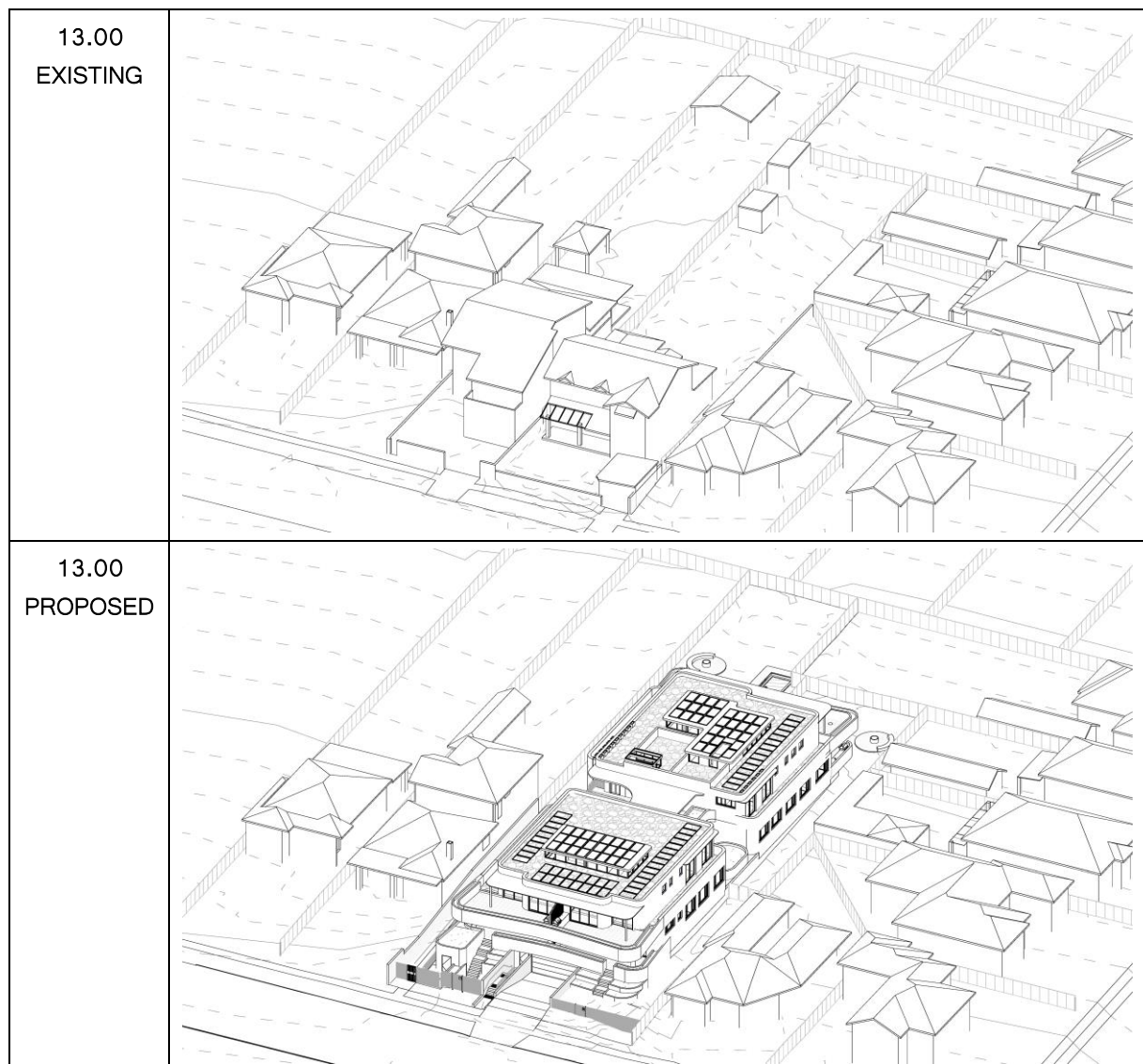
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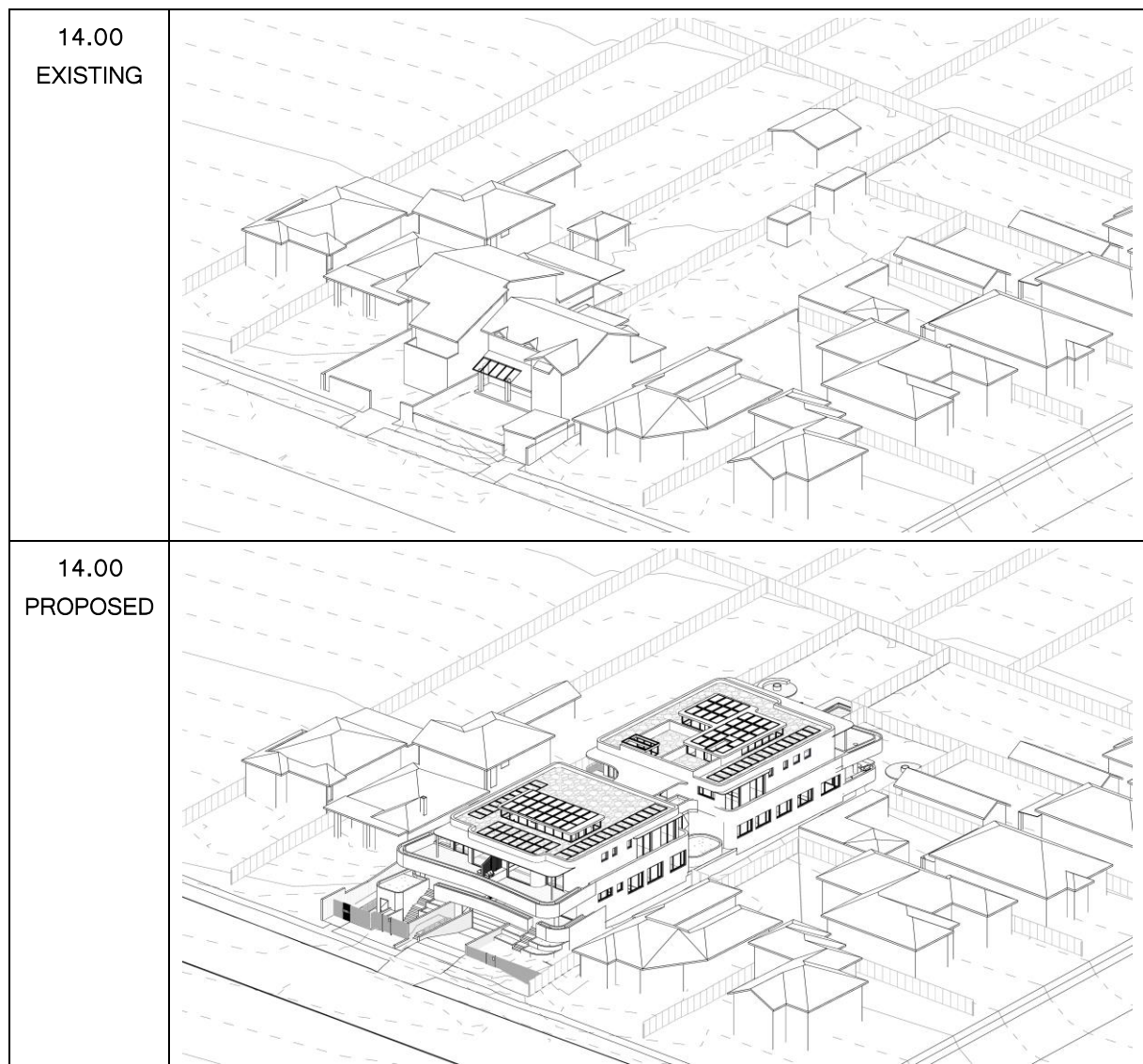


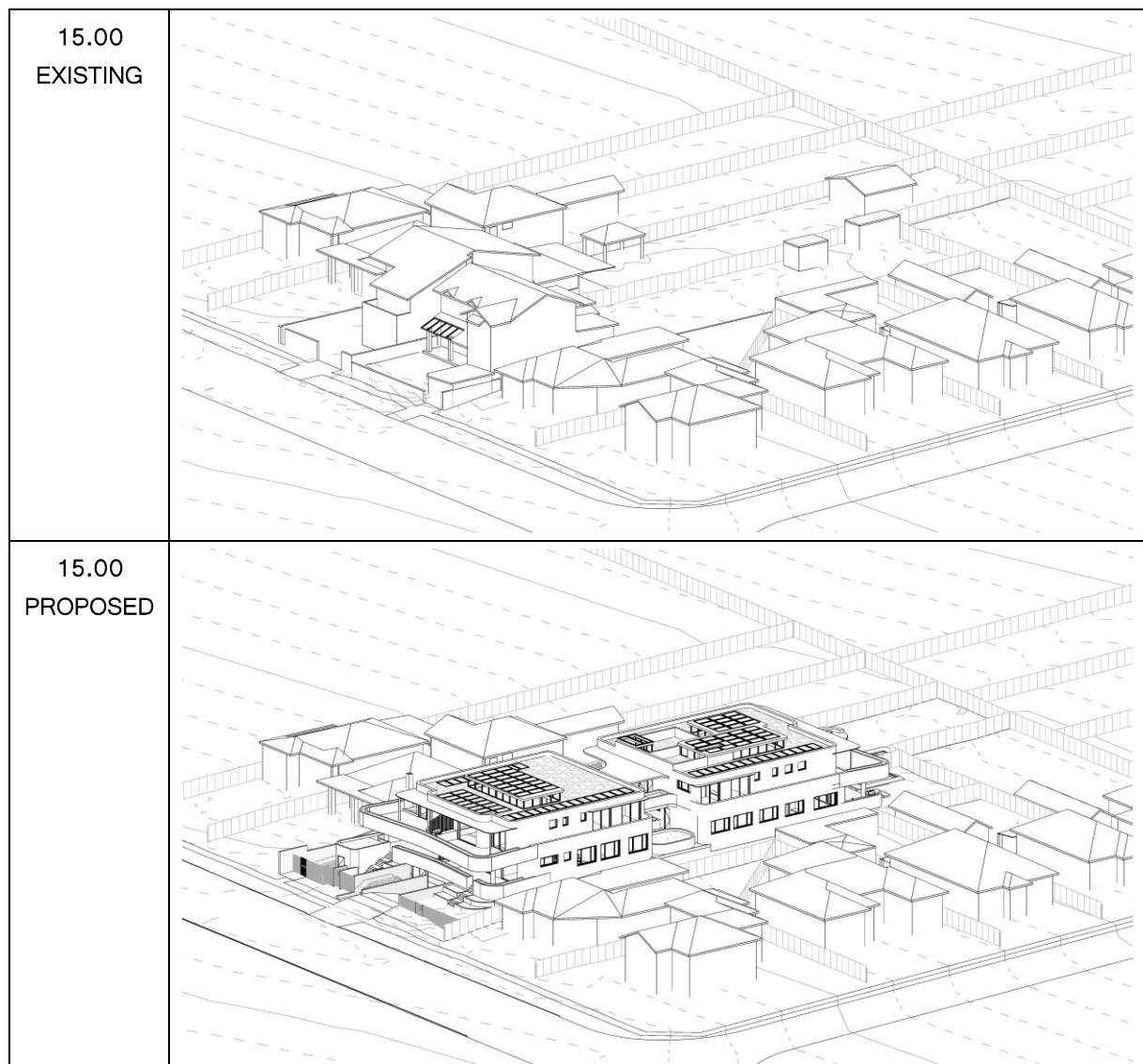












## C.0 APPENDIX C: DETAILED COMPLIANCE TABLE

The following table sets out in detail the solar access status of each Apartment in the current DA Scheme.

LEVEL	UNIT NUM.	ROOM	9	930	10	1030	11	1130	12	1230	13	1330	14	1430	15	> 2 hrs 9-3	Comply for Living + POS > 2 hrs	No sun
GROUND FLOOR	01	Living	H	H	H	H	N	N	N	N	N	N	N	N	N			
		POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.		N/A
	02	Living	Y	N	N	N	N	N	H	H	H	H	H	H	H			
		POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.		N/A
	03	Living	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	YES	YES	
		POS	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	YES.		N/A
	04	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES	
		POS	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES.		N/A
LEVEL 1	05	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES	
		POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.		N/A
	06	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES	YES	
		POS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	YES.		N/A
	07	Living	H	H	H	H	H	H	H	H	Y	Y	Y	Y	Y	YES	YES	
		POS	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	YES.		N/A
	08	Living	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	YES	YES	
		POS	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	YES.		N/A

8

6	6	0
75.0%	75.0%	0.0%
	75.0%	0.0%

### LEGEND

Y	RECEIVES COMPLIANT SUN
H	HABITABLE SPACES RECEIVES COMPLIANT SUN
N	DOES NOT COMPLY